

X-ray Means for Determining The Location of A Malignant Neoplasm And Its Radiotherapy

Abstract

During the first stage of the radiotherapy method, the location of a malignant neoplasm identified in the course of previous diagnostics, is determined, for which purpose the part (7) of the patient (5), including the said neoplasm, is scanned. Scanning is carried out by moving the radiation concentration zone (4) produced by crossing of several X-ray beams. Tissues density information is obtained with the help of the detectors (6), which the secondary radiation excited in the radiation concentration zone (4) is transported to. During the second stage, scanning is carried out using the same means as during the first stage, moving the concentration zone within the malignant neoplasm borders, determined during the first stage. In this instance, the X-ray sources (1), with the help of the control means (9) are reset to the increased intensity mode of operation, the intensity being sufficient for radiation damage of the malignant neoplasm tissues. To deliver the source radiation to the concentration zone and the secondary radiation to the detectors, various combinations of the collimators, X-ray lenses (2, 3) and hemi-lenses are used, which, together with the sources and detectors, form the X-ray optical system (8). When the concentration zone is being scanned, the X-ray optical system (8) as one whole and the patient (5) are moved relatively to each other (10a, 10b). The coordinate sensors (11), registering the said movement, and the detectors (6) are connected with their outputs up to the means (12) of data processing and imaging. Use of the said principle of obtaining information about the density of biological tissues and common means of X-ray beams generation at both stages assists in higher accuracy of measurements and dosage delivery, decreasing exposure of healthy tissues.